FUTURE CONDITIONS

The Study Team evaluated future conditions taking into consideration growth in background traffic and traffic generated by new and proposed developments in the study area. The background traffic and new development traffic was added to existing traffic counts to determine future traffic volumes.

BACKGROUND GROWTH

Based on historical counts, the growth rate used for background traffic was 0.5 percent per year. All balanced traffic volumes were grown by this percentage to determine background traffic volumes for one, five and ten years in the future. Developments outside the study are that were not directly analyzed are included in this growth rate.

DEVELOPMENT TRAFFIC

The Study Team identified four developments in the study area that will contribute to future traffic volumes. The developments are as follows:

1. Expansion of St. Patrick's Episcopal Day School (St. Patrick's). St. Patrick's is expanding to add 7th and 8th grade students at a location on MacArthur Boulevard near Ashby Street. These students will be dropped off at the existing school on Whitehaven Parkway and transported via bus to the new school. Additionally, staff trips will take place directly to and from the new school.

2. Field School. The Field School is relocating from its existing campus on Wyoming Avenue to a new location on Foxhall Road, north of W Street.

3. George Washington University at Mount Vernon College (GWU). Expansion of campus on Foxhall Road between Whitehaven Parkway and W Street. Construction of new driveway on Whitehaven Parkway.

4. Mayor's mansion on Foxhall Road between Reservoir Road and Whitehaven Parkway.

TRIP GENERATION

Additional traffic generated by the Field School was taken from the "Traffic Impact Analysis – The Field School" prepared by Gorove/Slade Associates, Inc., and dated June 2, 2000. The projected trips are as follows:

Table 7:
Field School Trip Generation

	AM Peak Hour	PM Peak Hour
Enter	106	14
Exit	68	72
Total	174	86

Traffic generated by GWU was taken from "The George Washington University at Mount Vernon College Master Plan Traffic and Parking Assessment," prepared by Gorove/Slade Associates, Inc., and dated May 17, 1999. The projected trips are as follows:

Table 8:
GWU Trip Generation

	AM Peak Hour	PM Peak Hour
Enter	151	4
Exit	4	143
Total	155	147

Additional traffic that will be generated by the remaining two developments was estimated using the manual *Trip Generation, 6th Edition* (Institute of Transportation Engineers, 1997).

Mayor's Mansion:

To establish rates for the Mayor's Mansion, the average rate for ITE 210 (Single Family Detached Housing) was used. In order to account for additional trips associated with the mansion, the Study Team assumed that the mansion would generate three times as many trips as a single family house. The total generated trips are as follows:

Table 9:
Mayor's Mansion Trip Generation

	AM Peak Hour	PM Peak Hour
Enter	1	3
Exit	4	2
Total	5	5

St. Patrick's:

ITE 521 (Private School, K-12) was used to establish trip generation rates for St. Patrick's. The expansion of the school will add 60 7th and 8th grade students, who will be dropped off and picked up at the existing school on Whitehaven Parkway. Since this expansion will create no new staff positions at the existing school, the total number of entering vehicles determined by ITE was used as the number of exiting vehicles. 33 trips were added each way during the AM peak hour, and 21 trips were added each way during the PM peak hour.

These students will be transported via bus to the new school location at MacArthur Boulevard and Ashby Street. Three bus trips are expected to leave Whitehaven Parkway, travel outbound on MacArthur and drop off the students at Ashby Street. For the return trip, the buses will continue outbound on MacArthur to Arizona Avenue. They will turn right onto Arizona, right onto Loughboro Road, right onto Foxhall Road and finally right onto Whitehaven Parkway to return to St. Patrick's. To model the buses, a passenger car equivalent of two was used, turning three bus trips into six passenger car trips. These bus

trips will only take place during the AM peak hour. The students will return to campus via bus prior to the PM peak hour.

The new school is expected to have a staff of ten. Thusly, ten trips were added directly to the new location at MacArthur Boulevard and Ashby Street.

Table 10 summarizes the total number of projected trips generated by the expansion of St. Patrick's.

Table 10:
St. Patrick's Trip Generation

	AM Peak Hour	PM Peak Hour
Enter	49	21
Exit	39	31
Total	88	52

Table 11 summarizes all trip generation related to the study area:

Table 11:
Total Study Area Trip Generation

	AM Peak Hour	PM Peak Hour
Enter	307	42
Exit	115	248
Total	422	290

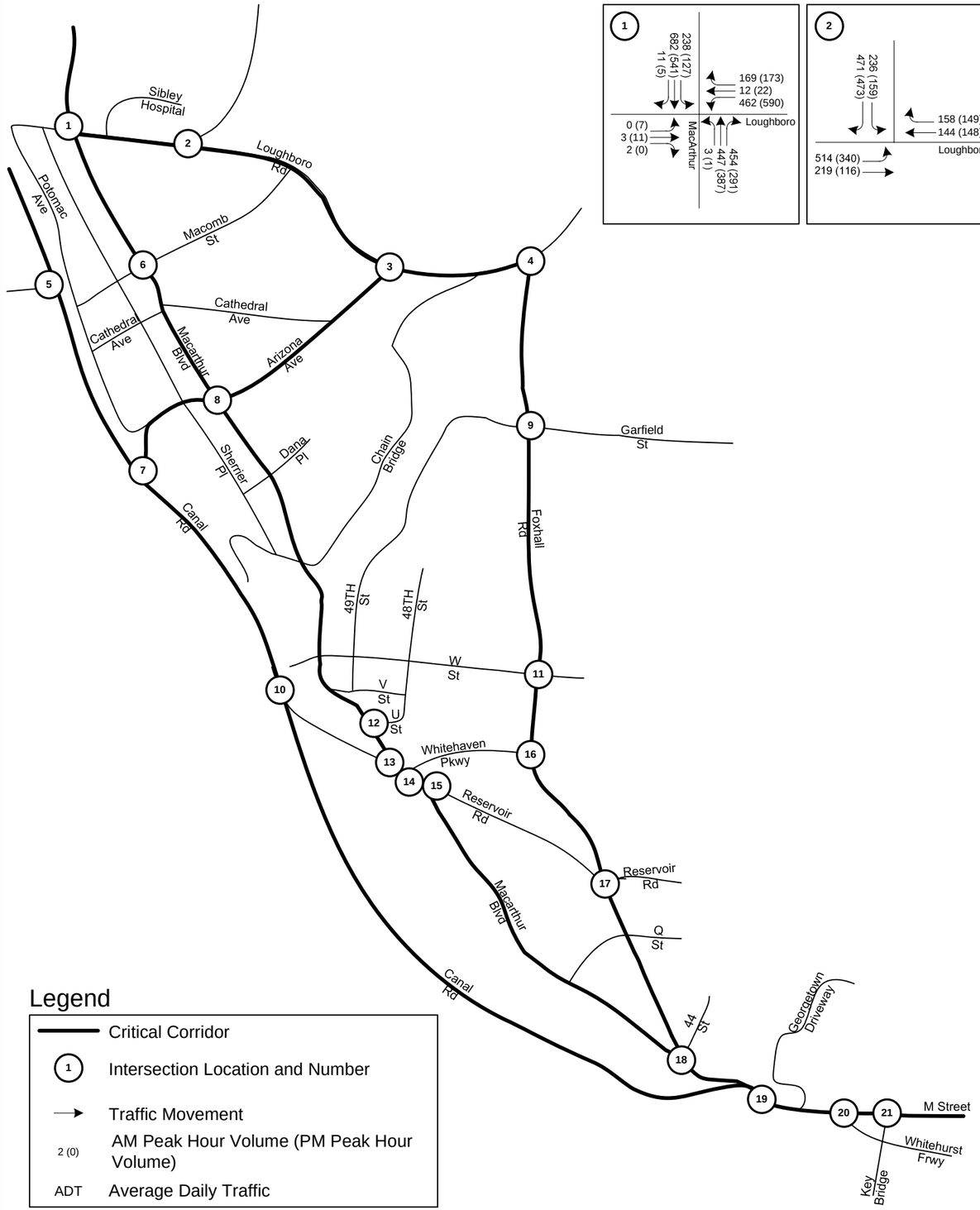
TRIP DISTRIBUTION

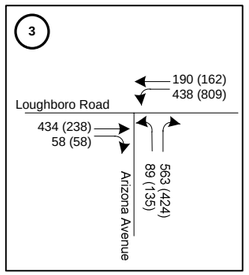
In the cases of the Field School and GWU, where possible, trips were distributed according to the information provided in their respective traffic studies. Once the boundaries of these traffic studies were passed, trips were distributed on the basis of existing traffic patterns. Trips for the Mayor's Mansion and St. Patrick's were largely distributed based on existing traffic patterns. Some trips either started or ended within the study area, and in some cases, both started and ended internally.

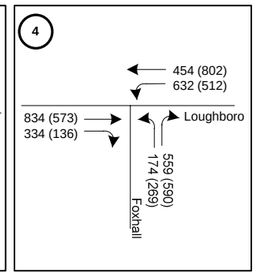
FUTURE LEVELS OF SERVICE

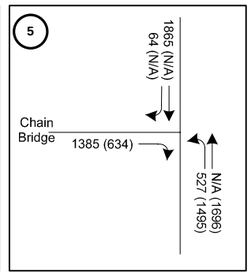
A one-year build-out was assumed for all developments. Site traffic and one-year background traffic were added at each intersection to create the volumes used for analysis. See Figure 17 for these volumes. Additionally, five and ten-year volumes can be found in Appendix G. No improvements were made to any of the intersections when analyzing the "no-build" condition[1].

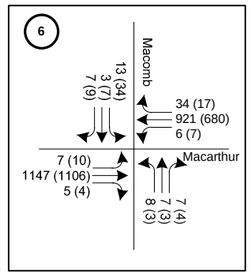
[1] "No-build" condition refers to a scenario without the implementation of transportation improvements. The "no-build" condition does include the additional trips generated by new development in the area and growth in background traffic.

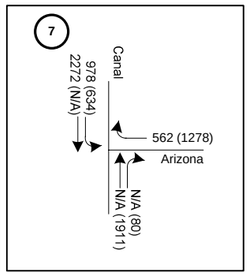


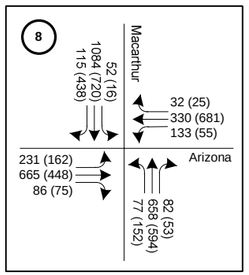


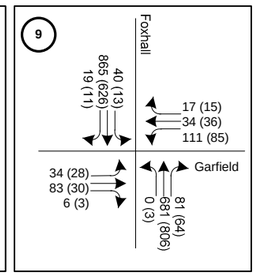


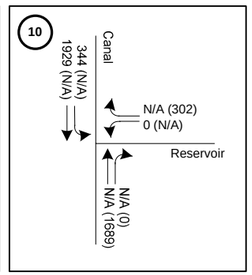


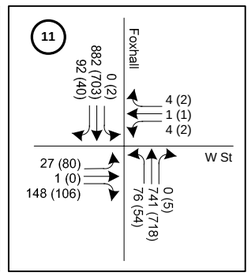


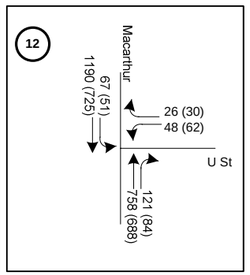


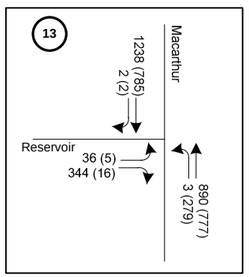


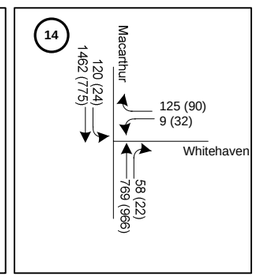


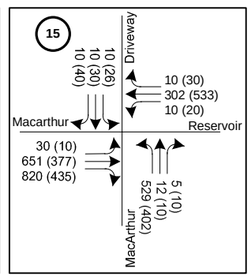


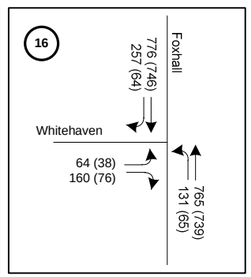


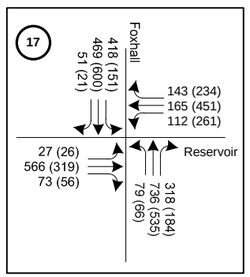


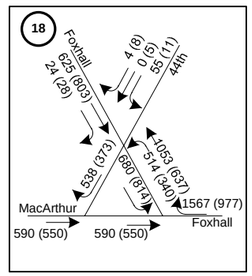


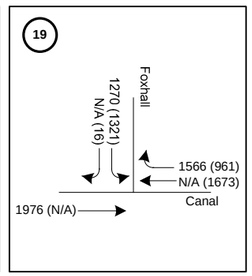


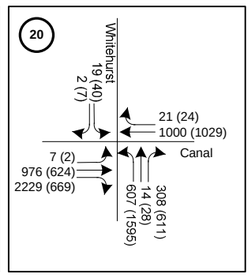


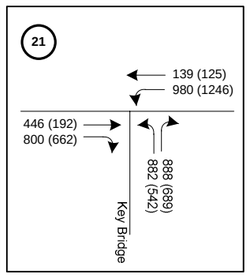












Legend

- Critical Corridor
- (1) Intersection Location and Number
- → Traffic Movement
- 2 (0) AM Peak Hour Volume (PM Peak Hour Volume)
- ADT Average Daily Traffic

Not to Scale		Palisades Traffic Impact Study	Forecast One-Year Traffic	FIGURE 17
August, 2002	N			

As with existing conditions, Synchro and SimTraffic were used to model and simulate future conditions. Table 12 shows levels of service under existing and no-build conditions.

Table 12:
Levels of Service, Existing vs. No Build Condition

Intersection	AM Peak Hour		PM Peak Hour	
	Existing LOS	One-year No-build LOS	Existing LOS	One-year No-build LOS
MacArthur Blvd and Loughboro Road	C	C	B	B
Loughboro Road and Dalecarlia Pkwy	E	E	C	B
Loughboro Road and Arizona Avenue	B	B	F	E
Loughboro Road and Foxhall Road	D	E	C	C
Canal Road and Chain Bridge	F	F	n/a	n/a
MacArthur Blvd and Macomb Street	B	C	B	B
Canal Road and Arizona Avenue	n/a	n/a	E	E
MacArthur Blvd and Arizona Avenue	F	D	D	C
Foxhall Road and Garfield Street	B	B	B	B
Canal Road and Reservoir Road	n/a	n/a	B	C
Foxhall Road and W Street	B	F	B	F
MacArthur Blvd and U Street	F	F	C	C
MacArthur Blvd and Reservoir Road (N)	F	F	A	A
MacArthur Blvd and Whitehaven Pkwy	F	B	C	B
MacArthur Blvd and Reservoir Road (S)	C	C	B	B
Foxhall Road and Whitehaven Pkwy	B	B	B	F
Foxhall Road and Reservoir Road	F	D	F	F
Foxhall Road/MacArthur Blvd/44th Street	D	D	C	C
Foxhall Road and Canal Road	E	E	E	E
Canal Road and Whitehurst Freeway	D	D	F	F
Canal Road and Key Bridge	D	D	C	C

Note: n/a = not applicable. These intersections have no stop-controlled or signalized movements during these time periods.

Although the delay per vehicle increased at most of the intersections, in most cases there was not enough of an increase to degrade the LOS. For intersections that were already operating at LOS F, no increase in delay or volume could lower the LOS. In some cases, delay per vehicle dropped, and LOS improved, due to greater delays at adjacent intersections. If adjacent intersections are so thoroughly congested that very little traffic gets through, traffic operations at downstream intersections may improve slightly.

As expected, the intersections closest to the areas of development – Foxhall Road's intersections with W Street and Whitehaven Parkway – show a noticeable degradation in LOS, from a very good LOS B to LOS F, or failure. When combined with the analysis of existing conditions, the no-build option gave further insight into potential improvements at various intersections.

As the preliminary improvements list was created and refined, analysis was performed for one, five and ten years in the future. All background and site traffic was included. Table 13 shows levels of service for these scenarios:

Table 13:
Future Levels of Service with Background and Site Traffic and Improvements

Intersection	AM LOS			PM LOS		
	1-year	5-year	10-year	1-year	5-year	10-year
MacArthur Blvd and Loughboro Road	C	C	C	B	B	B
Loughboro Road and Dalecarlia Pkwy	F	F	E	C	B	C
Loughboro Road and Arizona Avenue	C	D	D	B	C	C
Loughboro Road and Foxhall Road	E	C	C	C	B	B
Canal Road and Chain Bridge	F	F	F	n/a	n/a	n/a
MacArthur Blvd and Macomb Street	E	E	F	B	C	C
Canal Road and Arizona Avenue	B	C	C	E	E	E
MacArthur Blvd and Arizona Avenue	E	F	F	D	D	D
Foxhall Road and Garfield Street	B	C	B	B	B	B
Canal Road and Reservoir Road	A	A	A	A	B	B
Foxhall Road and W Street	B	C	B	B	B	B
MacArthur Blvd and U Street	C	C	C	B	B	B
MacArthur Blvd and Reservoir Road (N)	B	B	B	A	A	A
MacArthur Blvd and Whitehaven Pkwy	B	B	C	B	B	B
MacArthur Blvd and Reservoir Road (S)	C	C	C	B	B	C
Foxhall Road and Whitehaven Pkwy	A	A	A	A	A	A
Foxhall Road and Reservoir Road	F	F	E	F	F	F
Foxhall Road/MacArthur Blvd/44th Street	C	E	D	C	B	C
Foxhall Road and Canal Road	E	F	E	F	F	F
Canal Road and Whitehurst Freeway	D	D	D	F	F	F
Canal Road and Key Bridge	F	F	F	C	C	C

Note: n/a = not applicable. These intersections have no stop-controlled or signalized movements during these time periods.

Locations where the 10-year LOS is better than the one or five-year are locations where improvements were implemented. These improvements are in the next section of this study. It can be seen that for the majority of the intersections, ten-year levels of service are the same or better than one-year levels of service. In some cases, it took large-scale improvements to improve or maintain LOS. Examples of this are the intersection of Foxhall and Loughboro Roads and the intersection of Canal Road and Whitehurst Freeway. In other cases, simple timing changes were enough to create noticeable improvements.